

## WHAT IS CLAIMED IS:

1. A data recovery system, comprising:
  - an oversampler, which oversamples an input signal for n times and thus generates a plurality of oversampled signals, where n is an integer;
  - 5 a phase detection circuit, which receives the oversampled signals, and outputs a phase signal according to transitions between the oversampled signals; and
  - 10 a data pick circuit, which groups the oversampled signals into n groups and picks one of the groups as an output data according to the phase signal, wherein the output data is m-bit and m is an integer.
2. The system as claimed in claim 1, further comprising:
  - 15 a data overlap/skip detection circuit, which determines a status of the data according to the phase signal and a previous phase signal, and outputs the status; and
  - 20 a data correction circuit, which picks the output data and a last bit of a previous oversampled signal according to the status, and output an accurate data.
3. The system as claimed in claim 1, wherein the phase detection circuit comprises:
  - 25 a transition detector, which detects the transitions between the oversampled signals; and
  - 30 a tally, which groups the plurality of transitions into n groups, and outputs the phase signal corresponding to one of the groups with the maximum transition number.

4. The system as claimed in claim 3, wherein the transition detector comprises a plurality of XOR gates to perform XOR operations to each of the oversampled signals and the adjacent oversampled signal.

5       5. The system as claimed in claim 3, wherein the tally comprises:  
n adders, which count the number of transition; and  
a maximum selector, which outputs the phase signal according to the maximum number of transition.

6. The system as claimed in claim 1, wherein the data pick circuit is a multiplexer.

10       7. The system as claimed in claim 2, wherein the data pick circuit is a multiplexer.

8. The system as claimed in claim 2, wherein the status comprises an overlap signal, a skip signal and a normal signal, respectively for data overlap, data skip and no data overlap/skip.

15       9. The system as claimed in claim 2, wherein the data correction circuit comprises a buffer.

10. The system as claimed in claim 8, wherein when the status is the overlap signal, the data correction circuit picks m-1 bits from the m-bit output data.

20       11. The system as claimed in claim 8, wherein when the status is a skip signal, the data correction circuit receives the m-bit output data and a last bit of a previous oversampled signal.

12. The system as claimed in claim 8, wherein when the status is a normal signal, the data correction circuit receives the m-bit output data.

13. A data recovery method, comprising:  
oversampling an input signal for n times and producing a plurality  
of oversampled signals, wherein n is an integer;  
detecting the transitions of oversampled signals and outputting a  
5 plurality of transition signals;  
outputting a phase signal according to the transition signals; and  
grouping the oversampled signals into n groups, and outputs one of  
the groups as an output data according to the phase signal, wherein the  
output data is m-bit data and m is an integer.

10 14. The method as claimed in claim 13, further comprising:  
producing a status according to the phase signal and a previous  
phase signal;  
temporarily storing the output data in a buffer according to the status;  
and  
15 outputting an m-bit accurate data from the buffer.

16. The method as claimed in claim 14, wherein the status  
comprises an overlap signal, a skip signal and a normal signal, respectively  
corresponds to data overlap, data skip and no data overlap/skip conditions.

17. The method as claimed in claim 15, wherein the buffer receives  
m-bit output data and a last bit of a previous oversampled signal when the  
status is a skip signal.

18. The method as claimed in claim 15, wherein the buffer receives

m-bit output data when the status is a normal signal.

19. A data recovery method, comprising:

oversampling an input signal and producing a plurality of oversampled signals;

5       detecting transitions of oversampled signals and outputting a plurality of transition signals;

producing a phase signal according to the transition signals; and

outputting an output data from the oversampled signals according to the phase signal.

10      20. The method as claimed in claim 19, further comprising:

producing a status according to the phase signal and a previous phase signal;

picking the output data and a last bit of a previous oversampled signal into a buffer according to the status; and

15      outputting an accurate data from the buffer.